
Eriogonum diatomaceum (Polygonaceae: Eriogonoideae), a New Species from Western Nevada, U.S.A.

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ABSTRACT. A new species of *Eriogonum* subg. *Eucycla* (Polygonaceae, Eriogonoideae), *E. diatomaceum*, is described from the Pine Nut Range, Lyon County, Nevada, U.S.A. It is an edaphic endemic species restricted to chalky, diatomaceous outcrops of the Coal Valley Formation in Churchill Narrows south of Fort Churchill State Park. The new species is outwardly similar to the Great Plains species *E. pauciflorum* (sect. *Capitata*), but is more closely related to *E. ochrocephalum* and its relatives. *Eriogonum diatomaceum* may be distinguished by its sheathing, elliptic, densely gray-tomentose leaves, erect scapose and white-tinged tomentose flowering stems, capitate inflorescences, glabrous and creamy white flowers, and glabrous achenes.

Key words: Eriogonoideae, *Eriogonum*, Nevada, Polygonaceae, U.S.A.

Picciani and Reynolds first found *Eriogonum diatomaceum* (Polygonaceae Jussieu; Eriogonoideae Arnott) in June 1997 near Churchill Narrows in the Pine Nut Range of Lyon County, Nevada. The material was identified subsequently as an undescribed species by Reveal during a workshop session on wild buckwheats sponsored by the Jepson Herbarium in July 1997.

Eriogonum diatomaceum Reveal, J. Reynolds & Picciani, sp. nov. TYPE: U.S.A. Nevada: Lyon Co., 2.6 mi. (1.5 air mi.) SSW of Churchill (abandoned historic site along the railroad), 0.6 air mi. SW of Mill Canyon Creek crossing along the dirt road into Churchill Narrows, on barren slopes associated with *Atriplex*, T16N, R24E, sec. 21 SE¼ of the NE¼ (N39°14'30", W119°17'15"), 4425 ft. elev., 29 June 2001, J. L. Reveal 8306 (holotype, US; isotypes, BRY, GH, K, MARY, MO, NY, RENO, UC, US, UTC). Figure 1.

Ab *E. ochrocephalo* floribus albis et ab *E. anemophilo* foliis caulibus vaginantibus differt.

Low, matted, herbaceous perennials with a branched, woody caudex forming a loosely branched mat 0.5–2.5 dm across, arising from a stout woody taproot; *leaves* sheathing up the stems for (1.5)2–4 cm with the lower stems densely white-tinged tomentose among the petiole bases and persistent leaves, the leaf blade elliptic, (0.5)0.8–2(2.3) × (0.3)0.5–1.2(1.8) cm, equally densely grayish tomentose on both surfaces, the margins entire and plane, the apex broadly acute, the base cuneate, the petiole slender, (0.3)0.5–1.5(1.8) cm long, tomentose, the petiole base elongate-triangular to triangular, 3–5 × 2–4 mm, densely white-tomentose abaxially, glabrous adaxially except for a band of long hairs across the base; *flowering stems* scapose, erect, (0.4)0.5–1.5(2) dm long, white-tinged tomentose; *inflorescences* capitate, the heads 1–1.5 cm across; *bracts* scale-like, 3 to 8, elongate-triangular to triangular, 1–3 × 0.7–1.2 mm, white tomentose abaxially, green and essentially glabrous adaxially except for the thinly tomentose margins and sparsely tomentose apices, slightly acute basally; *peduncles* lacking; *involucre*s congested, 5 to 10 per head, turbinate, rigid, (2.5)3–4.5 × 2–3 mm, tomentose abaxially, glabrous adaxially, the 5 to 7 acute teeth 0.6–1 mm long, the bractlets linear, 3–4 mm long, minutely fringed with minute gland-tipped cells, the pedicel 3–5 mm long, glabrous; *flowers* numerous, creamy white with green-tan (in anthesis) to red-tinged (in fruit) bases and midribs, becoming rose-red in late fruit, (1.5)2.5–3 mm long, glabrous except for minute glands along the midribs adaxially, the tepals essentially similar, ovate-oblong, those of the inner whorl slightly narrower and



Figure 1. Habit of *Eriogonum diatomaceum* Reveal, J. Reynolds & Picciani. Photograph by J. L. Reveal.

more distinctly oblong than those of the outer whorl, united $\frac{1}{3}$ – $\frac{1}{2}$ their length with the fused basal portion distinctly pustulose in fruit; *stamens* exerted, 3–3.5 mm long, the filaments sparsely pilose basally, the anthers cream-white to pale yellow, 0.6–0.7 mm long, broadly oblong to ovate; *achenes* light brown, 2–2.5 mm long, glabrous, the subglobose base tapering to a long, 3-angled beak.

Etymology. From *diatoma* NL (New Latin), diatom, and by extension *diatomacea* NL for diatomaceous earth, as to the substrate on which the plant is restricted. Both words are derived from the Greek *diatomos*, cut in half.

Eriogonum diatomaceum is known from a single population on low hills south and southwest of Churchill, Lyon Co., Nevada. This single population encompasses 15 more or less distinct occurrences restricted to the northeastern portion of the Pine Nut Range. The population is scattered over approximately three square miles of Bureau of Land Management lands. Less than 50,000 individual plants are known (Reynolds, 2001).

The new species, informally called Churchill Narrows buckwheat, is restricted to diatomaceous soils of the Coal Valley Formation on relatively undisturbed dry barren exposed knolls and drainages on all aspects between 4300 and 4560 feet in elevation. The habitat supports a sparse vegetation

cover dominated by Churchill Narrows buckwheat in association with shadscale (*Atriplex confertifolia* (Torrey & Frémont) S. Watson), princes plume (*Stanleya pinnata* Nuttall var. *pinnata*), Bailey's greasewood (*Sarcobates baileyi* Coville), and bud-sage (*Picrothamnus desertorum* Nuttall) and other species such as *Kochia americana* S. Watson, *Tetradymia glabrata* Torrey & A. Gray, *Psathyrotes annua* (Nuttall) A. Gray, *Eriogonum deflexum* Torrey var. *nevadense* Reveal and *E. lemmonii* S. Watson.

The Coal Valley Formation is a fluviolacustrine deposit of soft lake beds, sandstone, conglomerate, and sedimentary breccia. Andesite and andesitic sediments are commonly imbedded. The formation contains a unique fossil flora of aquatic plants and mammalian remains (Berry, 1927). The deposit is part of the series of Tertiary diatomites that filled the subsidiary basins within the Basin and Range extensional tectonic system of Nevada. The known aerial extent of outcrop where the Churchill Narrows buckwheat is found includes approximately 150 acres of variable thickness (8 to 30 feet) (Carpenter, 1997). The volcanic sedimentary rock associated with this formation is generally described as late Miocene to early Pliocene in age, and consists of stream and lake deposits of silty shale, diatomaceous shale, pebbly conglomerate, siltstone,

and sandstone. The major components are fossil diatoms (amorphous silica), calcium montmorillonite, feldspar, and gypsum.

The new species was found during an impact survey for the Bureau of Land Management prior to granting a mining lease. If mining were permitted, *Eriogonum diatomaceum* instantly would be endangered. Even if the area is not mined, current off-road vehicle activity in the region is sufficient to threaten the long-term survival of the species. Current consultation between the Bureau of Land Management and the State of Nevada (which already considers the taxon to be a "sensitive plant") may mean that a formal proposal for federal protection may not be necessary. Nonetheless, monitoring will be necessary to assure the species' long-term survival.

Eriogonum diatomaceum is a member of the subgenus *Eucycla* (Nuttall) Kuntze. The new species is outwardly similar to the Great Plains species, *E. pauciflorum* Pursh, and especially the densely tomentose, more compact phase, variety *gnaphaloides* (Bentham) Reveal of southeastern Wyoming and adjacent western Nebraska. The similarity of the sheathing leaves is particularly striking. These leaves, plus the long scapose, tomentose flowering stems, capitate inflorescences, and creamy white flowers add to the impression. Nonetheless, *E. diatomaceum* is more closely allied to *E. ochrocephalum* S. Watson and its numerous relatives common to the Great Basin of Nevada and adjacent states. Also outwardly similar to the new species in general appearance are *E. loganum* A. Nelson, a narrow endemic of northern Utah, and *E. brandegei* Rydberg of Colorado. Both belong to the *E. brevicaulis* Nuttall complex and as such are unrelated.

The new species is allied to those species of the *Eriogonum ochrocephalum* complex that may be characterized as matted perennials with scapose stems and capitate inflorescences, and specifically with those that have a rigid, usually turbinate involucre. The majority of these eight species have bright yellow flowers and generally glabrous and/or glandular flowering stems. Of the various entities found in western Nevada, *E. ochrocephalum* var. *alexandrae* Reveal has tomentose stems, and both *E. anemophilum* Greene and *E. tiehmii* Reveal have creamy white flowers. None of these species have sheathing leaves. The long scapose flowering stem of *E. diatomaceum* rivals the lengths observed

in *E. ochrocephalum* var. *sceptrum* Reveal of southwestern Idaho, and the two share the long, narrow, turbinate involucre. From all of these species, the new species also may be readily distinguished by the dense, essentially lanate tomentum of the leaves, which is evenly distributed on both surfaces. The remaining 12 species of the *E. ochrocephalum* complex have membranaceous rather than rigid involucre.

In Reveal's (1985) key to Nevada wild buckwheats, the new species may be keyed as follows:

- 20(16). Involucres 2–2.5 mm long, floccose without; leaf blades broadly elliptic to obovate or suborbicular; flowers glabrous; Eureka, Lander, Pershing, and southwestern Humboldt Cos. 14. *E. anemophilum*
- Involucres (2.5)3–4.5 mm long, densely tomentose or sparsely floccose without; leaf blades elliptic to oblong; flowers glabrous or sparsely glandular 20a
- 20a(20). Flowers glabrous; leaves sheathing up the stems (1.5)2–4 cm; involucre turbinate, 2–3 mm wide, the teeth 0.6–1 mm long; Lyon Co. 14a. *E. diatomaceum*
- Flowers sparsely glandular; leaves strictly basal; involucre turbinate-campanulate, 3–4 mm wide, the teeth 1.5–2 mm long; Esmeralda Co. 15. *E. tiehmii*

Paratypes. U.S.A. **Nevada:** Lyon County, S end of Churchill Narrows, 1.5 air mi. S of Churchill, T16N, R24E, sec. 22, 4275 ft. elev., *Picciani 1* (K, MARY, NY, RENO, UC, US); 2 air mi. W of Churchill Narrows, 2 air mi. SSW of Churchill, T16N, R24E, sec. 21, 4480 ft. elev., *Picciani 2* (BRY, GH, K, MARY, MO, NY, RENO, UC, US).

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